

What is claimed is:

1. An apparatus for performing motion estimation, the apparatus comprising:
  - a first memory for storing current image data as a reference block having
  - 5 a predetermined size;
  - a second memory for storing previous image data as a search region for searching motion vectors;
  - a motion estimation skip unit for receiving motion vectors and SAD values of the previous image data, compensating for the motion of the current
  - 10 image data, and determining whether or not motion estimation for the current image data is skipped based on the compensation result of the current image data;
  - a motion estimation unit for receiving the current image data and the previous image data from the first and second memories to perform motion
  - 15 estimation for the current image data;
  - a comparator for outputting the minimum value of estimation results output from the motion estimation unit as a final motion estimation result;
  - a multiplexer for selecting and outputting any one of the compensation result generated from the motion estimation skip unit and the final estimation
  - 20 result generated from the comparator based on the determination result of the motion estimation skip unit;
  - an address generator for outputting addresses related to the motion estimation and the motion compensation to the first and second memories; and
  - a controller for controlling the operation of the motion estimation skip unit
  - 25 and the operation of generating the addresses in the address generator based on the determination of the motion estimation skip unit.
2. The apparatus of claim 1, wherein the second memory comprises:
  - a first memory block for storing data in odd rows of the previous image
  - 30 data; and
  - a second memory block for storing data in even rows of the previous image data.
3. The apparatus of claim 1, wherein the motion estimation skip

unit comprises:

a motion compensator for obtaining the median value of the motion vectors of the previous image data, performing the motion compensation, and obtaining the maximum value of the SAD values; and

5 a skip determiner for comparing the motion estimation result with the maximum value of the SAD values to determine whether or not the motion estimation is skipped.

4. The apparatus of claim 3, wherein the motion compensator  
10 comprises a processing element for performing motion estimation of the current image data.

5. The apparatus of claim 3, wherein the skip determiner is  
15 constituted as a comparator for comparing the motion compensation result with the maximum value of the SAD values.

6. The apparatus of claim 3, wherein if the motion compensation  
result is smaller than the maximum value of the SAD values, the skip  
determiner sets the value of an estimation skip flag so that the motion  
20 estimation is skipped and the motion compensation is performed, and if the  
motion compensation result is greater than or equal to the maximum value of  
the SAD values, the skip determiner sets the value of the estimation skip flag so  
that the motion estimation is performed.

7. The apparatus of claim 6, wherein the multiplexer receives the  
25 value of the estimation skip flag as a signal for selecting any one of the  
estimation compensation result generated from the motion estimation skip unit  
and the motion estimation result generated from the motion estimation unit.

8. The apparatus of claim 3, wherein operations related to the  
30 motion compensation and the motion estimation are performed in each of  
macro blocks.

9. The apparatus of claim 8, wherein the motion estimation unit

sub-samples data in the search region in the ratio of 2:1 so that only half of a bit of data is selected from each line of the macro block.

10. The apparatus of claim 8, wherein the macro blocks used in operations related to motion estimation and motion compensation are each positioned on the left side of the reference block, on the reference block, and on the right-and-up side of the reference block.

11. The apparatus of claim 1, wherein the motion estimation unit comprises a plurality of processing elements for estimating a motion of the current image data.

12. A method of performing motion estimation, the method comprising:

- (a) receiving motion vectors of previous image data;
- (b) obtaining the median value of the motion vectors;
- (c) receiving current image data;
- (d) compensating for motion of the current image data based on the median value of the motion vectors;
- (e) receiving SAD values of the previous image data and obtaining the maximum value of the SAD values;
- (f) comparing the motion compensation result with the maximum value of the SAD values;
- (g) skipping motion estimation of the current image data and outputting the motion compensation result if the motion compensation result is smaller than the maximum value of the SAD values in step (f); and
- (h) performing motion estimation for the current image data if the motion compensation result is greater than or equal to the maximum value of the SAD values in step (f), and outputting the motion estimation result.

13. A computer-readable recording medium for storing a program for executing the method of claim 12.